

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re Application of:)
)
YAMAMOTO, Tomoya, et al.)
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Serial Number: 10/540,129)
)
Filed: June 21, 2005)
)
For: WATER-BASED INKS FOR)
INKJET PRINTERS)

Examiner: Patrick Dennis Niland
Group Art Unit: 1796

DECLARATION UNDER 37 C.F.R. § 1.132

Honorable Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

Now comes YAMAMOTO Tomoya, who deposes and states that:

1. That I am an inventor of the above-identified application,
2. That I am a graduate of Kanazawa University at Ishikawa Prefecture, Japan, and received my Master degree in the field of industrial chemistry in the year 1991.
3. That I have been employed by CANON FINETECH INC. for 6 years as a researcher in the field of industrial chemistry, specifically printer inks.
4. That I understand English language or, at least, that the contents of the Declaration were made clear to me prior to executing the same.
5. That the following experiment was carried out by me to substantiate that the neutralization of a block copolymer, which contains acidic groups, with an alkali in an amount chemically equivalent to the acidic groups cannot render the block copolymer 100% neutral.

Experiment

(1) Preparation of inks

Employed as a block copolymer was the same ABC triblock copolymer (Polymer 1) as that used in the Example of the Specification of the subject application. A portion of the

triblock copolymer was neutralized with an aliquot of a 0.1N aqueous solution of sodium hydroxide, which contained the alkali in an amount 1.0 times in terms of chemical equivalents (i.e., 1.0-fold equivalent) as much as the carboxyl groups in the portion of the triblock copolymer, to obtain a first neutralized triblock copolymer. Another portion of the triblock copolymer was neutralized with another aliquot of the 0.1N aqueous solution of sodium hydroxide, which contained the alkali in an amount 1.3 times in terms of chemical equivalents (i.e., 1.3-fold equivalents) as much as the carboxyl groups in the portion of the triblock copolymer, to obtain a second neutralized triblock copolymer.

The first neutralized triblock copolymer (1 parts) was added together with a colorant (C.I. Solvent Blue 44; 1 part) to N,N-dimethylformamide (19 parts). Water was then added to the resultant mixture such that the amount of water became 20 parts in combination with the water in the aqueous solution of sodium hydroxide, and N,N-dimethylformamide was then eliminated by a rotary evaporator. To the concentrate so obtained, diethylene glycol (2 parts) and glycerin (2 parts) were added to obtain a water-based ink as "Ink 26". Another ink was likewise obtained as "Ink 27" from the second neutralized triblock copolymer. Infrared absorption spectra of the first and second, neutralized block copolymers were measured in the same manner as described in the Specification at page 28, line 23 to page 29, line 8. The results are tabulated below

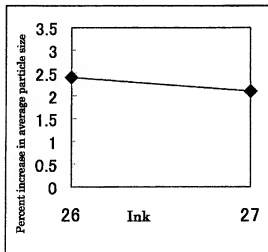
	Polymer	Colorant	Amount of the alkali*	Degree of neutralization (%)
Ink 26	1	C.I. Solvent Blue 44	1.0	70
Ink 27	1		1.3	78

* Amount of the alkali actually added as expressed supposing that the smallest amount of the alkali required to achieve a neutralization degree of 100% was 1.

Despite the use of the alkali in the 1.0-fold and 1.3-fold chemical equivalents, respectively, the first and second, neutralized block copolymers were neutralized only 70% and 78%, respectively. It has, therefore, been substantiated that the neutralization of a block copolymer, which contains acidic groups, with an alkali in an amount chemically equivalent to the acidic groups cannot render the block copolymer 100% neutral.

(2) Evaluation

Inks 26 and 27 were left at rest at 60°C for 4 weeks, and the particle sizes of their colorant were measured by the dynamic light scattering method. As a result, as shown in the following diagram, they were lower in dispersion stability than Inks 1 to 14 in the Examples of the Specification of the subject application, in each of which the block copolymer had been neutralized with the alkali added in an amount within the range specified in invention of the subject application.



6. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

7. FURTHER DEONENT SAITH NOT.

Respectfully submitted,

Signature: YAMAMOTO Tomoya

Tomoya Yamamoto
Date: 08/07/2008